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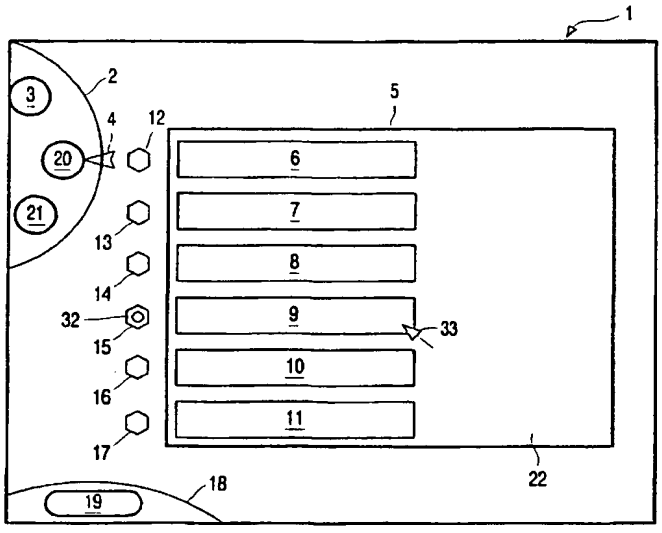
(54) Title: MENU DISPLAY FOR A GRAPHICAL USER INTERFACE




(57) Abstract: Methods of providing a menu display (1) for a GUI (31) are disclosed together with a computer program, a computer-readable storage medium (34) and apparatus (31) for the same. Methods include the steps of displaying a menu (1) in the form of a group of icons (3, 20, 21) wherein each icon corresponds to a menu option and is selectable by a user, and displaying an icon selector graphic (4) adapted to identify the icon (20) corresponding to a menu option currently selected by a user. A textual label (19) or a submenu (6-11) corresponding to the currently selected menu option / icon (20) may be displayed. Also, the group of icons and the icon selector graphic may be rotatable relative to each other and where the icon selector graphic is stationary and the group of icons rotatable, the centre of rotation of the group of icons may be located outside the periphery of a display. Further disclosed is a rotatable menu window (5).

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DESCRIPTION

# MENU DISPLAY FOR A GRAPHICAL USER INTERFACE

This invention relates to a method of providing a menu display for a graphical user interface (GUI) and to a computer program, a computer-readable storage medium and apparatus for the same.

As is well known, GUIs are used in many interactive applications in which a user is required on occasion to select one of a series of user selectable options. Such GUIs can be found in computer systems, televisions, automatic teller machines, games consoles and the like.

Complex interactive applications, say requiring multiple menu structures, mean that the corresponding GUI must be simple, efficient and flexible if the user is to be able to use such an application quickly and efficiently. This may be achieved to some extent by providing a menu display which is firstly suitable for interfacing with a simple, ergonomic input device and secondly by providing a menu display which is intuitive in its operation.

Known input devices such as mouses, trackballs, keyboards, remote control keypads and touch sensitive screens each have physical attributes which make them either more or less preferable to use with particular menu displays, and indeed vice versa. For example, in our European patent application EP 0498082 A1, a curved band of selectable icons associated with menu options is provided to correspond to the natural hand-movement of a user using a hand-held pointer interface.

With respect to intuitiveness, for the operation of a menu system to be intuitive, it should be capable of operating in a manner which lends itself to the vagaries of human behaviour and anticipation. Although perhaps less quantifiable than physiological factors, intuitiveness is nevertheless important, and perhaps more so in a menu display used only infrequently.

It is therefore an aim of the invention to provide a menu display for a GUI which is capable of being operated quickly and efficiently.

BNSDOCID: <WO 0116690A2 I >

According to a first aspect of the present invention, a method of providing a menu display for a GUI comprises the steps of displaying a menu in the form of a group of icons wherein each icon corresponds to a menu option and is selectable by a user; displaying an icon selector graphic adapted to identify the icon corresponding to a menu option currently selected by a user; and displaying a textual label corresponding to the currently selected menu option wherein the group of icons and the icon selector graphic are rotatable relative to each other and in accordance with a user's input.

A menu display provided by a method according to the first aspect of the present invention is intuitive and suitable for interfacing with simple, ergonomic input apparatus. In addition, the textual labels provide a explicit reminder of the nature of a menu option having been selected using a non-explicit icon.

In a preferred method according to the first aspect of the present invention, the textual label corresponding to the currently selected option is one of a group of individual textual labels, each describing a different menu option.

In such a preferred method, the group of textual labels is ideally rotatable and, in particular, by appending the textual labels to a rotatable textual label carrier. During a user's change of selection of menu option, this enables the new textual label to be rotated into position in parallel with the rotation of the group of icons relative to the icon selector graphic. To further facilitate a smooth transition of textual labels during a user's change of menu option, the group of textual labels is preferably arranged in a curved fashion, for example, in a circle.

In order to provide a compact display, it is preferable that the centre of rotation of the textual labels is located outside the periphery of the display so that textual labels not in use are rotated off-screen. Also, in order to emphasise the textual label corresponding to the currently selected menu option, it is preferable that only one full text label is in view at any one time.

BNSDOCID: <WO 0116690A2 I >

In accordance with the first aspect of the present invention, the group of icons and the icon selector graphic are rotatable relative to each other. Where the icon selector graphic is stationary and the group of icons is rotatable, the group of icons may be appended to a rotatable carrier. As with the textual labels above, in order to provide a compact display, the centre of rotation of the group of icons may be located outside the periphery of the display and at least one currently unselected icon may be out of view at any given time.

Again similarly to the group of textual labels, the group of icons may be arranged in a curved fashion such as a circle to enable a smooth transition during selection of a new icon / menu option.

According to a second aspect of the present invention, a method of providing a menu display for a GUI comprises the steps of displaying a primary menu in the form of a group of icons wherein each icon corresponds to a primary menu option and is selectable by a user; displaying an icon selector graphic adapted to identify the icon corresponding to a primary menu option currently selected by a user; displaying a submenu associated with the primary menu option current selected by the user; and, in the event of a new primary menu option being selected, displaying a new submenu associated with the new primary menu option, wherein the group of icons and the icon selector graphic are rotatable relative to each other in the plane of the menu display, and in accordance with a user's input. Such a menu display is intuitive and suitable for interfacing with simple, ergonomic input apparatus.

In a preferred embodiment according to the second aspect of the present invention, the submenu options are located on a rotatable window such that in the event of a new primary menu option being selected, the window is rotated, ideally rotated 180° or a multiple thereof, whereby the new submenu is revealed to be on the flip-side of the window. This enables a smooth transition between submenus which is both intuitive and relaxing to the eye.

In order to select a primary menu option, a user may, in a first mode of operation, rotate the group of icons relative to the icon selector graphic in either direction using first selection means and, in a second mode of operation,

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select a submenu option using the same first selection means in the same fashion. Switching between first and second modes of operation may be accomplished by a user using second selection means.

For example, in the first mode of operation, up and down cursor keys may be used to rotate the icon group in anti-clockwise and clockwise respectively, and in the second mode of operation, the up and down cursor keys may be used to scroll up and down through the submenu options. The switching between first and second modes of operation may be accomplished using left and right cursor keys, or a single toggle key. In addition to keys on a key pad, rocker switches, buttons and many other conventional input means would also be suitable as would be apparent to one of ordinary skill in the art.

With regard to the configuration of the group of icons and the icon selector graphic, the configurations as described above with respect to a method according to the first aspect of the present invention apply equally to a method according to a second of the present invention.

According to a third aspect of the present invention, a method of providing a menu display for a GUI comprises the steps of displaying a menu in the form of a group of icons, each icon corresponding to a menu option selectable by a user; and displaying a textual label corresponding to the currently selected menu option, wherein the textual label corresponding to the currently selected options is one of a rotatable group of textual labels, each textual label corresponding to a different menu option.

The group of textual labels may be appended to a rotatable textual label carrier and, for the reasons mentioned above, it is desirable that the centre of rotation of the textual labels is located outside the periphery of the display; that the group of textual labels is arranged in a curved fashion such as a circle; and that only one full text label is in view at any one time.

According to a fourth aspect of the present invention, a method of providing a menu display for a GUI comprises the steps of displaying a menu in the form of a group of icons wherein each icon corresponds to a menu option and is selectable by a user; and displaying an icon selector graphic adapted to identify the icon corresponding to a menu option currently selected

by a user, wherein the icon selector graphic is stationary and the group of icons is rotatable relative to the icon selector graphic in accordance with a user's input; and wherein the centre of rotation of the group of icons is located outside the periphery of a display.

The group of icons may be appended to a rotatable carrier and at least one currently unselected icon may be out of view at any given time.

According to a fifth aspect of the present invention, a method of providing a menu display for a GUI comprises the steps of displaying a first menu in a rotatable window; and, in the event of a second menu being selected by a user, displaying the second menu in place of the first menu by rotating the window, ideally rotated 180° or a multiple thereof, to reveal the second menu on the flip-side of the window.

Also, during rotation, the illusion of perspective may be produced by shrinking the part of the window and its contents perceived to be behind the display and enlarging the part of the window and its contents perceived to be in front of the display wherein both the degree of shrinking and enlargement is related to the perceived distance of the part of the window and its contents from the display.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying figures in which:

Figures 1 to 4 show a menu display for a GUI provided by a method in accordance with the present invention; and

Figure 5 shows, schematically, a computer system capable of implementing the menu display of figures 1 to 4.

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In figure 1, a menu display 1 is shown comprising a primary menu in the form of a rotatable icon wheel 2 positioned, partially in view, in the top left corner of the menu display. Seven icons corresponding to primary menu options are appended to the icon wheel, three being in view 3, 20, 21 with the remainder of the icons and the icon wheel being "located" off screen. A currently selected icon 20 / primary menu option is indicated by reference to an icon selector graphic 4 located adjacent to the icon wheel. In order to select a different icon / primary menu option, a user may rotate the icon wheel either clockwise or anticlockwise by pressing appropriate keys on a keypad (not shown). Alternatively a trackball (not shown) or a mouse with a wheel selector (not shown) may be used to rotate the icon wheel by rotating the trackball or wheel accordingly.

The menu display 1 further comprises a rotatable feedback wheel 18 positioned in the bottom left corner of the menu display, again only partially in view. Seven text labels corresponding to the icons / primary menu options are appended to the feedback wheel with only full text label 19 in view at any one time. Similar to the icon wheel 2, the remainder of the text labels and the feedback wheel are "located" off screen. The feedback wheel rotates in parallel with the icon wheel whereby the text label in view describes the currently selected icon 20 / primary menu option. For example, a "web" text label may be displayed when an icon depicting a networked computer is selected corresponding to a menu option to use the internet.

The menu display 1 further comprises a window 22 surrounded by a frame 5. In the window, a submenu is provided consisting of a group of text labels 6 - 11, each corresponding to a submenu option. The submenu options may include gateways to further submenus, links to user documents or external websites, or system controls such as volume up / down etc. Outside the window, 6 buttons 12 - 17 are located, each corresponding to an adjacent text label / submenu option. The submenu options may be selected in a variety of conventional ways; for example, by a user using a mouse (not shown) to position a display cursor 33 over a button or text label and clicking to select; or alternatively, by a user pressing appropriate keys on a keypad (not shown) to

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position an identifier 32 on the button 15 associated with the required submenu option, and then pressing a further key (not shown) to confirm the selection.

The submenu options associated with the text labels 6 - 11 in the window 22 are each related to the subject matter of the icon 20 / primary menu option selected on the icon wheel. For example, if the selected icon relates to the web (say as before by depicting a networked computer), the text labels for the submenu options might include "web search", "on-line news", "favourite websites" etc.

In the event that a user selects a different icon / primary menu option, for example, an icon depicting a television, the original group of text labels corresponding to the original submenu options in the windows 6 - 11 is removed and replaced by a new group of text labels corresponding to new submenu options relating to television, for example, "sports", "news", "documentaries", "favourite shows", "TV set-up" etc.

Figures 2 to 4 sequentially illustrate the changes in the menu display when a different icon / primary menu option is selected. The icons 3, 20, 21, 23 and the icon wheel 2 rotate during a user's new selection whereby the previously selected icon 20 moves away from the icon selector graphic 4 and is replaced by icon 21 corresponding to the newly selected primary menu option. As the view of the icon wheel is partial, icon 3 goes off the screen and icon 23 appears. Corresponding changes are made in the feedback wheel 18 in that old text label 19 is replaced by new text label 24 describing the newly selected icon / primary menu option.

In parallel, the window 22 rotates in the frame 5 about a vertical axis relative to the menu display 1 and in the plane of the menu display. The illusion of perspective during rotation is produced by shrinking the part of the window and its contents when "behind" the display and enlarging the part of the window and its contents when "in front" of the display and whereby both shrinking and enlargement are progressive relative to the perceived distance of the window and its contents from the display.

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During rotation, the old group of text labels 6 - 11 which relate to the icon previously selected are removed from view and replaced by a new group of text labels 25 - 30 on the flip-side of the window 5.

The menu display may be manipulated by cursor keys on a keypad (not shown) wherein, in a first mode, up and down cursor keys are used to rotate the icon wheel 2 clockwise and anticlockwise respectively, and in a second mode, the same up and down cursor keys are used to position the identifier 32 on the required button. Switching between modes is accomplished by using left and right cursor keys; left to control the icon wheel and right to control the identifier. Alternatively, a toggle switch such as a single key may be used to toggle between first and second modes of operation.

A computer system 31 capable of implementing the above method is shown schematically in figure 5. The computer system comprises a processor having a central processing unit (CPU) and a random access memory (RAM). The computer system further comprises a display, keyboard, mouse and a floppy disk drive, all coupled to the processor in known manner. A floppy disk 34 is provided for the floppy disk drive having recorded thereon a computer program comprising instructions for performing a method according to the present invention. Alternatively, other types of computer-readable storage media and corresponding hardware may be used.

Implementation of a method according to the present invention in such a computer system may be readily accomplished in hardware, in software by appropriate computer programming and configuration or through a combination of both. Of course, such programming and configuration is well known and would be accomplished by one of ordinary skill in the art without undue burden. It would further understood by one of ordinary skill in the art that the teaching of the present invention applies equally to other types of apparatus having a GUI and not only to the aforementioned computer system.

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CLAIMS

1. A method of providing a menu display for a GUI comprising the steps of:

displaying a menu in the form of a group of icons wherein each icon corresponds to a menu option and is selectable by a user;

displaying an icon selector graphic adapted to identify the icon corresponding to a menu option currently selected by a user; and

displaying a textual label corresponding to the currently selected menu option

wherein the group of icons and the icon selector graphic are rotatable relative to each other and in accordance with a user's input.

2. A method according to claim 1 wherein the textual label corresponding to the currently selected options is one of a group of individual textual labels, each describing a different menu option.

3. A method according to claim 2 wherein the group of textual labels is rotatable.

4. A method according to claim 3 wherein the group of textual labels is appended to a rotatable textual label carrier.

5. A method according to claim 3 or 4 wherein the centre of rotation of the textual labels is located outside the periphery of the display.

6. A method according to any of claims 2 to 7 wherein only one full text label is in view at any one time.

7. A method according to any preceding claim wherein the icon selector graphic is stationary and the group of icons is rotatable.

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8. A method according to claim 7 wherein the group of icons is appended to a rotatable carrier.

9. A method according to claim 7 or 8 wherein the centre of rotation of the group of icons is located outside the periphery of the display.

10. A method according to any of claims 7 to 9 wherein at least one currently unselected icon is out of view at any given time.

11. A method of providing a menu display for a GUI comprising the steps of:

displaying a primary menu in the form of a group of icons wherein each icon corresponds to a primary menu option and is selectable by a user;

displaying an icon selector graphic adapted to identify the icon corresponding to a primary menu option currently selected by a user;

displaying a submenu associated with the primary menu option current selected by the user; and

in the event of a new primary menu option being selected, displaying a new submenu associated with the new primary menu option

wherein the group of icons and the icon selector graphic are rotatable relative to each other in the plane of the menu display, and in accordance with a user's input.

12. A method according to claim 11 wherein the submenu options are located on a rotatable window; and wherein, in the event of a new primary menu option being selected, the window is rotated whereby the new submenu is revealed to be on the flip-side of the window.

13. A method according to claims 12 wherein, in the event of a new primary menu option being selected, the window is rotated 180°.

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14. A method according to any of claims 11 to 13 wherein, in a first mode of operation, in order to select a primary menu option, a user is able to rotate the group of icons relative to the icon selector graphic in either direction using first selection means; and wherein, in a second mode of operation, a user is able to select a submenu option using the same first selection means in the same fashion.

15. A method according to claim 14 whereby switching between the first and second modes of operation is accomplished by a user using second selection means.

16. A method according to claim 15 wherein the first selection means comprises up and down cursor keys on a keypad, and the second selection means comprises left and right cursor keys on the keypad.

17. A method according to claim 15 wherein the second selection means comprises a toggle switch for toggling between the first and second modes of operation.

18. A method according to any of claims 11 to 17 wherein the icon selector graphic is stationary and the group of icons is rotatable.

19. A method according to claim 18 wherein the group of icons is appended to a rotatable carrier.

20. A method according to any of claims 18 or 19 wherein the centre of rotation of the group of icons is located outside the periphery of the display.

21. A method according to any of claims 18 to 20 wherein at least one currently unselected icon is out of view at any given time.

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22. A method of providing a menu display for a GUI comprising the steps of:

displaying a menu in the form of a group of icons, each icon corresponding to a menu option selectable by a user; and

displaying a textual label corresponding to the currently selected menu option,

wherein the textual label corresponding to the currently selected options is one of a rotatable group of textual labels, each textual label corresponding to a different menu option.

23. A method according to claim 22 wherein the group of textual labels is appended to a rotatable textual label carrier.

24. A method according to claim 22 or 23 wherein the centre of rotation of the textual labels is located outside the periphery of the display.

25. A method according to any of claims 22 to 24 wherein only one full text label is in view at any one time.

26. A method of providing a menu display for a GUI comprising the steps of:

displaying a menu in the form of a group of icons wherein each icon corresponds to a menu option and is selectable by a user; and

displaying an icon selector graphic adapted to identify the icon corresponding to a menu option currently selected by a user,

wherein the icon selector graphic is stationary and the group of icons is rotatable relative to the icon selector graphic in accordance with a user's input; and wherein the centre of rotation of the group of icons is located outside the periphery of a display.

27. A method according to claim 26 wherein the group of icons is appended to a rotatable carrier.

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28. A method according to any of claim 26 or 27 wherein at least one currently unselected icon is out of view at any given time.

29. A method of providing a menu display for a GUI comprising the steps of displaying a first menu in a rotatable window; and, in the event of a second menu being selected by a user, displaying the second menu in place of the first menu by rotating the window to reveal the second menu on the flip-side of the window.

30. A method according to claim 29 wherein, in the event of a new menu being selected, the window is rotated 180°.

31. A method according to claim 29 or 30 wherein, during rotation, the illusion of perspective is produced by shrinking the part of the window and its contents perceived to be behind the display and enlarging the part of the window and its contents perceived to be in front of the display; and wherein both the degree of shrinking and enlargement is related to the perceived distance of the part of the window and its contents from the display.

32. A computer program comprising instructions for performing a method according to any preceding claim.

33. A computer-readable storage medium having recorded thereon a computer program according to claim 32.

34. Apparatus having a display, a processor and a user input device for providing a GUI menu display in accordance with claims 1 to 31.

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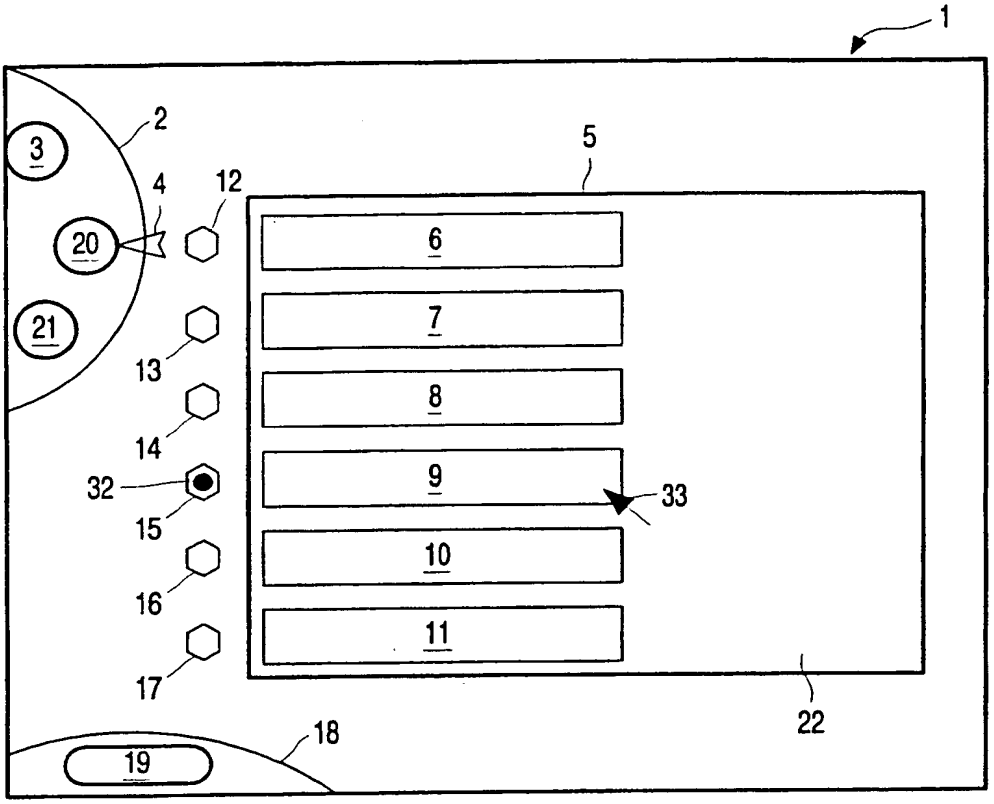
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FIG. 1

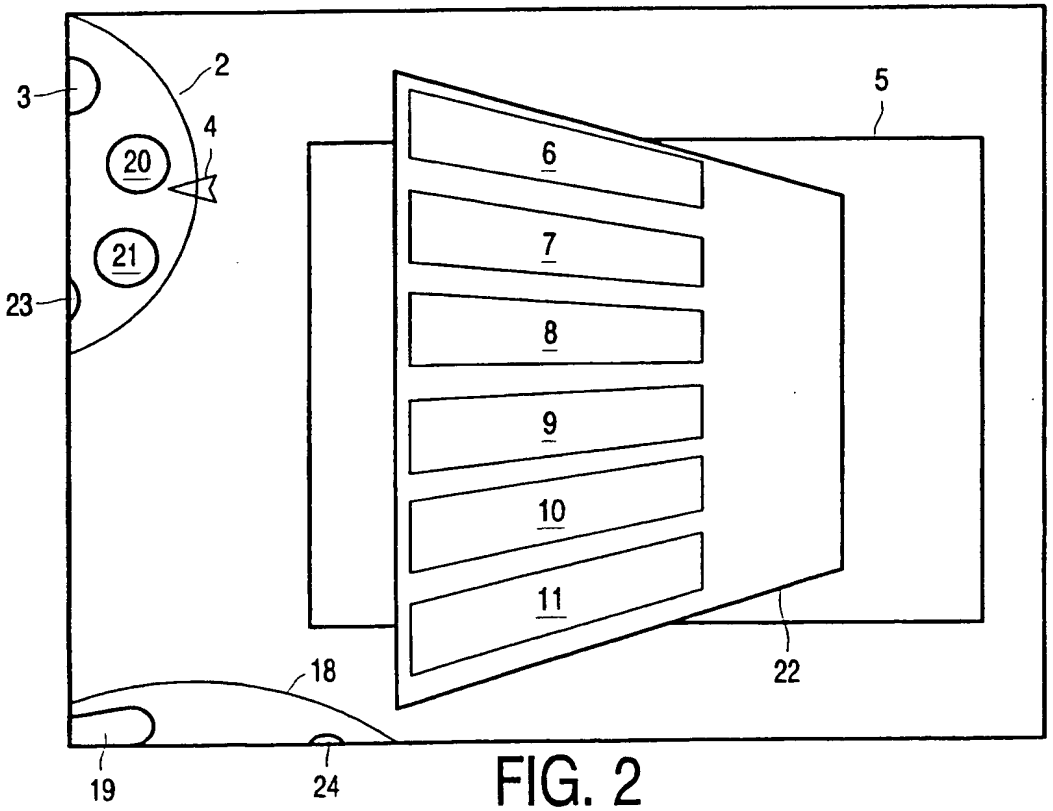
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FIG. 2

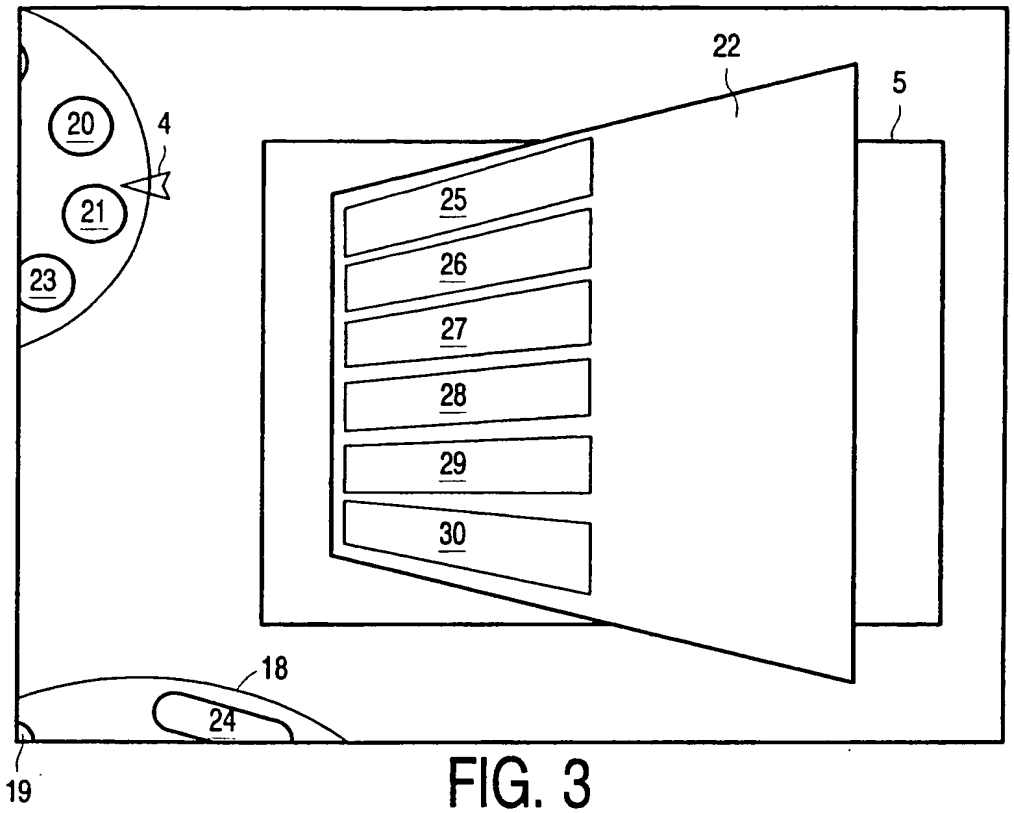


FIG. 3

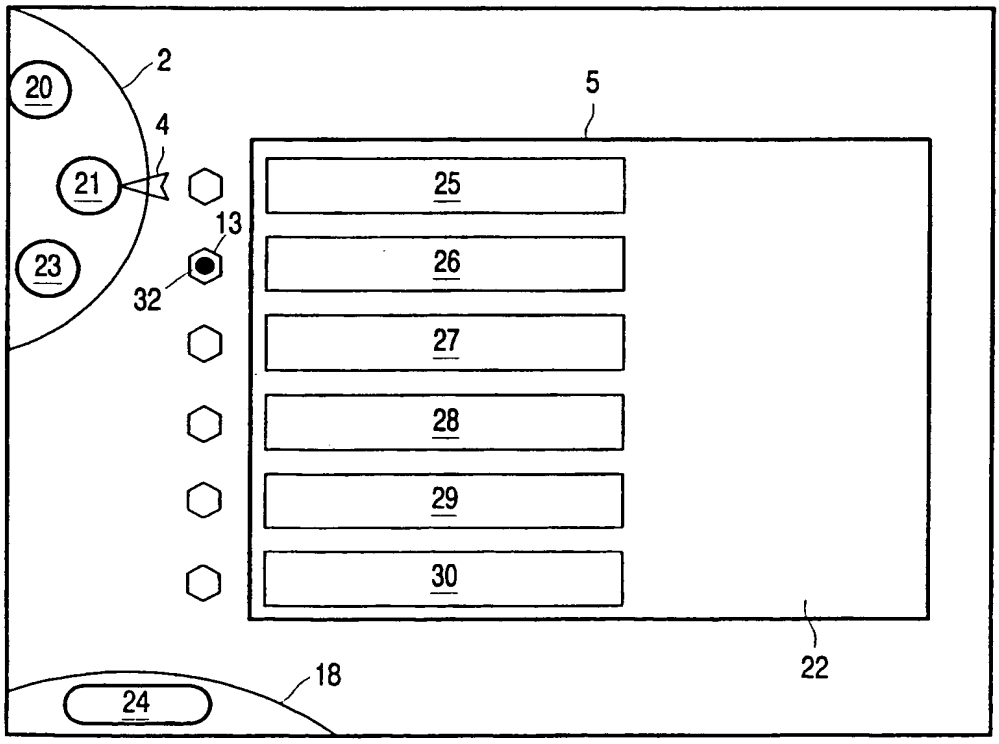


FIG. 4

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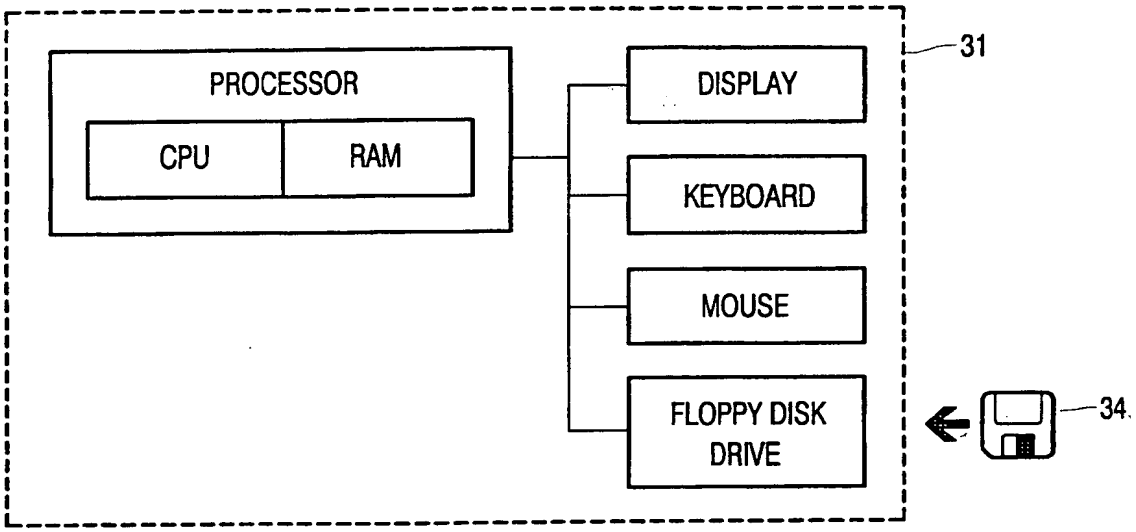
PROCESSOR
CPU
RAM
DISPLAY
KEYBOARD
MOUSE
FLOPPY DISK DRIVE
31
34

FIG. 5

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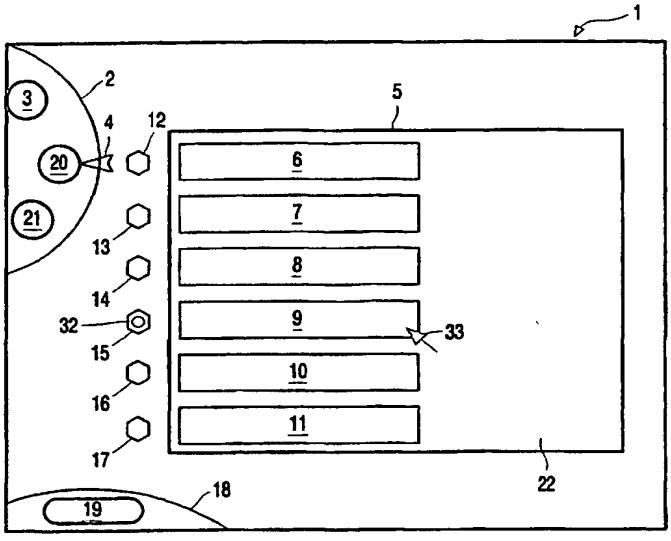


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# INTERNATIONAL SEARCH REPORT

Interi nal Application No
PCT/EP 00/07903

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F3/033

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 5 940 076 A (GARNER DAVID OWEN ET AL)<br>17 August 1999 (1999-08-17) | 1-5,<br>7-10,<br>22-24,<br>26,28 |
| A | abstract<br>column 3, last paragraph -column 4,<br>paragraph 3<br>column 5, paragraph 5<br>figures 4-7 | 11 |
| | --- | |
| X | WO 98 28912 A (PHILIPS ELECTRONICS NV<br>;PHILIPS NORDEN AB (SE))<br>2 July 1998 (1998-07-02)<br>the whole document | 1,11,<br>14-22,<br>26-28 |
| | --- | |
| | -/-- | |

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 19 December 2000 | 15.03.2001 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | CIARELLI, N |

Form PCT/ISA/210 (second sheet) (July 1992)



BNSDOCID: <WO___0116690A3_I_>

# INTERNATIONAL SEARCH REPORT

Interi nal Application No
PCT/EP 00/07903

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| P,X | EP 0 944 218 A (KONINKL PHILIPS ELECTRONICS NV) 22 September 1999 (1999-09-22) | 26-28 |
| P,A | the whole document | 1,11,22 |

Form PCT/ISA/210 (continuation of second sheet) (July 1992)



BNSDOCID: <WO___0116690A3_I_>

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 00/07903

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-28

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.



BNSDOCID: <WO___0116690A3_I_>

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10,22-28

A method of providing a menu display for a GUI comprising the steps of displaying a menu in the form of a group of icons and displaying a textual label wherein only one full text label is in view at any one time (invention 1).

1.1. Claims: 11-21

A method of providing a menu display for a GUI comprising the steps of displaying a primary menu in the form of a group of rotatable icons, displaying a rotatable icon selector graphic and displaying a submenu associated with the primary menu option current selected by the user in which in the event of a new primary menu option being selected a new submenu associated with the new primary menu option is displayed (invention 2).

2. Claims: 29-34

A method of providing a menu display for a GUI comprising the steps of displaying a first menu in a rotatable window and, in the event of a second menu being selected by a user, displaying the second menu in place of the first menu by rotating the window to reveal the second menu on the flip-side of the window (invention 3).

-

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter... ...nal Application No
PCT/EP 00/07903

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 5940076 A | 17-08-1999 | WO 9928815 A | 10-06-1999 |
| WO 9828912 A | 02-07-1998 | EP 0888687 A | 07-01-1999 |
| | | JP 2000506714 T | 30-05-2000 |
| EP 0944218 A | 22-09-1999 | FR 2776415 A | 24-09-1999 |
| | | JP 11327741 A | 30-11-1999 |

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